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Measuring efficiency in clinical departments☆

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Abstract

Objectives: This paper explores the possibilities and limitations of obtaining and interpreting efficiency measurement on the level of the clinical department. We discuss the limitations of case-mix groupings such as the diagnosis related groups on this level.
Methods: Hospital costs are allocated to clinical departments and efficiency measured using data envelopment analysis (DEA). Outputs are measured as number of discharges adjusted for case-mix using DRGs. The effect of department vs. hospital on the level of measured efficiency is analysed using a simple fixed effects regression model.
Results: We find that measured efficiency depends critically on the chosen model specification. Some department types, notably children's departments have systematically lower levels of measured efficiency.
Conclusions: : Our findings have implications for the monitoring and financing of clinical departments. DRG type instruments should be applied with caution both for monitoring and financing purposes on the departmental level.

Keywords: Hospital efficiency; Data envelopment analysis; DRG; Hospital costs

1. Introduction

Measures of hospital efficiency play an important role in the evaluation of health policy initiatives [1,2] and in comparative analyses of health systems [3]. They can also be used in the monitoring of resource utilisation, although the value of this is sometimes questioned [4]. A common feature of these applications, however, is that efficiency is measured on the hospital level. Thus most measures of hospital efficiency are "average" measures over a set of clinical departments that may perform quite differently[1]. From a policy point of view this may not always be satisfactory. In many systems we find that decision-making power is increasingly delegated to the departmental level. Clinical departments thus become "firms within a firm" and there is subsequently a demand for performance measures that are relevant on this level.

The main aim of this paper is to discuss the applicability of measures of efficiency on the level of the clinical department. The discussion is done within the

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[1] Two publications in Danish [5,6] are notable exceptions.

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context of the Norwegian health care sector where the internal organisation of hospitals has gradually shifted from a centralised to a decentralised model of decision-making. In 2003 98% of all clinical departments had their own budget, while the share of departments that use internal pricing for ancillary services increased from 12% to 34% from 1999 to 2003 [7]. Also the financing of hospital services is increasingly aimed at providing incentives on the departmental level. The share of departments that have an element of DRG based financing has increased from 21% to 63% in the same period. Thus there is substantial autonomy on the budgetary level, a development that is supported by organisational models with increased focus on management issues and departmental leadership.

A question then is whether this departmental autonomy is (or can be) accompanied by monitoring instruments such as measures of efficiency. In this study we focus on two issues related to this question: The first issue relates to the possibility of actually obtaining valid measures of efficiency at the departmental level. A persistent challenge in the economic analysis of hospitals has always been to account for the multi-product nature of hospital production [8]. The usefulness of departmental based measures of efficiency will therefore critically depend on their robustness to the choice of output specification.

Our second issue is the extent of variation of measured efficiency between different department types. Systematic differences between department types may be an indication of both inaccuracies in the measurement of outputs, but also of differences in production technologies that are not captured in more aggregated models.

Our focus is not as much on the need for efficiency measures in internal management[2] as on the possibility to use DRG-type output measures to provide departmental measures of efficiency for monitoring and financing purposes.

This paper is structured as follows. In Section 2 we discuss the clinical department as unit of analysis, describe the methodology used to calculate costs and activity, and present some descriptive data. Efficiency measures are obtained using the non-parametric approach of data envelopment analysis (DEA). This is described in Section 3. Section 4 then describes differences in measures of departmental cost efficiency, while Section 5 provides the concluding discussion.

[2] Where a number of tools such as balance scorecards, etc. are available.

2. Clinical departments as decision making units

The organisational structure of hospitals will vary, but hospitals can broadly be characterised by three different types of activities: Administrative and technical support; ancillary services and clinical departments. We choose a framework in which clinical departments serve as the core units of a hospital, in the sense that the decisions made in the clinical departments will determine the need for/use of resources at both administrative/technical support level and in the ancillary departments. Consequently we view each clinical department as a single decision making unit. When we interpret measures of efficiency at the departmental level we need, however, to take into account that the performance of each department will depend on the performance of both administrative/technical support departments and on the performance of the ancillary departments. We return to this point in more detail below.

Hospitals treat a variety of patients using several different inputs. There is no consensus as for how to measure hospital outputs, generally the chosen output vector depends on the available data and, to some extent, the problem to be analysed [8]. In this paper we use as our starting point the number of treated patients and correct these for differences in case-mix by using the diagnosis related groups (DRG). While there are other ways of adjusting for case-mix the use of DRGs is particularly relevant in the Norwegian context, due to the systems integral part in the financing of the hospital sector [1]. As noted the income of clinical departments increasingly depends on the DRG-adjusted number of discharges. For monitoring purposes there is also increased interest in comparing average costs per DRG across departments.

We also provide extensions to the basic DRG-framework along two lines. First we separate out day care as an output. The motivation for this is that day care patients, not being in need of overnight beds, provide a different conceptual output than traditional inpatients.